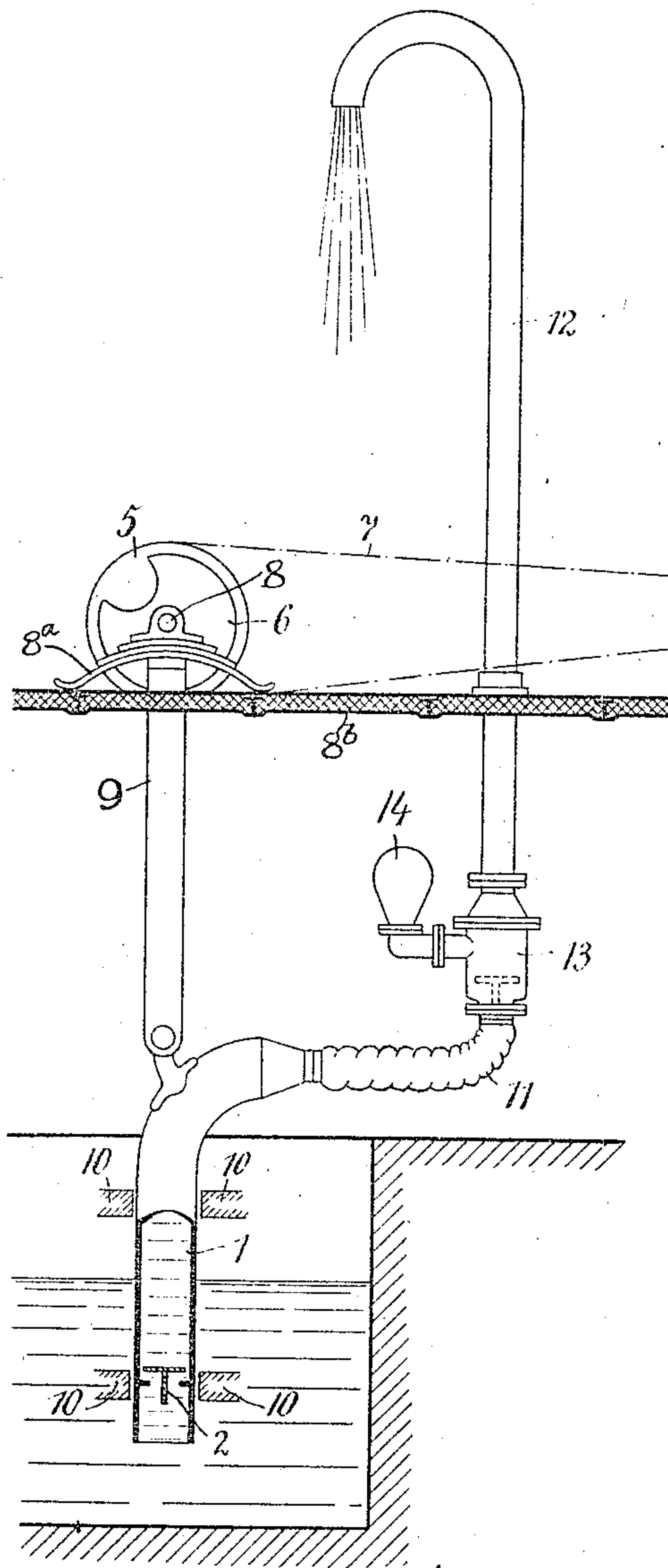


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Fig. 2.



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PUMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHAN SIGISMUND FASTING, a subject of the King of Denmark, residing at Frederiksberg, near Copenhagen, Denmark, have invented certain new and useful Improvements in Pumps, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

10 This invention relates to means for operating pumps of the general character of that shown in Letters Patent of the United States, No. 315,171, dated April 7, 1885. In pumps of this character there is no piston but the pump barrel is reciprocated somewhat rapidly so that, by reason of the inertia of the water or other fluid pumped, the pump barrel is moved more rapidly than the water or other fluid. Such pumps are particularly adapted for use as mud or sand pumps, but are obviously capable of use for pumping water, air or any fluid or material which has the general characteristic of fluidity.

25 In accordance with the invention the pump barrel is reciprocated rapidly by means of an eccentric weight mounted to rotate upon a movable axis which is connected to the pump barrel, so that the latter partakes of the rapid reciprocations or vibrations induced by the rotation of such eccentric weight about the movable axis of rotation.

35 The invention will be more fully explained hereinafter with reference to the embodiments thereof illustrated in the accompanying drawing in which—

40 Figure 1 is a view in outline, representing one embodiment of the invention, and Fig. 2 is a similar view, representing another embodiment of the invention.

In the embodiment of the invention represented in Fig. 1 the tube or pump barrel 1 is shown as having near its lower end a check valve 2 opening upward and as supported by springs 3, secured to a fixed support 4, so that the pump barrel may reciprocate in a longitudinal direction. The pump barrel, in this case, is shown as supported in a vertical position and as having its lower end directly immersed in the liquid to be pumped, but, as will be obvious, it might be supported in any other position and might be connected through a flexible pipe, or otherwise, with the body of liquid to be pumped. As will be understood, when the

pump barrel is reciprocated rapidly, the valve 2 is moved from its seat during the downward movement, or other relative movement, of the pump barrel, provided such movement of the pump barrel is more rapid than the movement of the liquid in the same direction under the influence of gravity or pressure from any other source, and during the upward or other relative movement of the pump barrel the valve is closed and the liquid is moved upward or forward. In this manner an upward or forward pulsating flow of the liquid or fluid through the valve 2 and the pump barrel 1 is obtained, and it will be obvious that the strength of the flow will depend mainly on the rapidity of the pulsations. To effect the desired reciprocations of the pump barrel, there is provided an eccentric weight 5 which is rotated rapidly by any suitable means, as by a belt pulley 6 upon which the weight is mounted and a belt 7, and the axis of rotation of the weight is supported in suitable bearings which are movable in a longitudinal direction with the pump barrel, such movable axis or movable bearings therefor being connected with the longitudinally movable pump barrel 1 so that the latter is reciprocated with the reciprocations of such axis or bearings which are induced by the rapid rotation of the eccentric weight. As shown in Fig. 1 the bearings 8 of the axis of rotation of the weight are secured directly to the pump barrel 1 or to an extension thereof, and are therefore movable longitudinally with respect to the pump barrel, so that the pump barrel itself, being thus movably supported, partakes of the reciprocations of the movable bearings of the axis of rotation of the eccentric weight.

In Fig 2 the pump barrel 1 provided with a check valve 2 and shown as immersed in the liquid to be moved, is guided in its reciprocations by guides 10 and is connected by a link 9 with the bearings 8 of the pulley 6 which carries the eccentric weight 5 and is driven by a belt 7. In this case the bearings 8 are supported movably upon springs 8^a which rest upon a fixed support 8^b. The reciprocations of the bearings 8 or of the axis of rotation of the unbalanced or eccentric weight 5 are therefore transmitted to the pump barrel through the link 9. In this case also the discharge pipe 12 of the pump is shown as mounted upon the fixed support 8^b and as connected with the pump barrel 1 by

a flexible pipe 11. The discharge pipe is also shown as provided with a check valve 13 and with an air chamber 14. Obviously the check valve 2 may be located at any convenient point and the pump barrel may be reciprocated in a right line or in a curved line.

Various other modifications in the construction and arrangement of the parts will readily suggest themselves and it is understood, therefore, that the invention is not restricted to the particular construction and arrangement shown and described herein.

I claim as my invention:

1. The combination with a pump barrel capable of longitudinal reciprocation and a check valve therefor, of an eccentric rotatable weight and bearings for the axis of rotation of the weight movable longitudinally with the pump barrel and connected there-

with, whereby the pump barrel is reciprocated with the reciprocations of said bearings induced by the rotation of the eccentric weight.

2. The combination with a pump barrel capable of longitudinal reciprocation and a check valve therefor, of a pulley having an eccentric weight and bearings for said pulley connected with the pump barrel, whereby the pump barrel reciprocates with the reciprocations of said bearings induced by the rotation of the eccentric weight.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHAN SIGISMUND FASTING.

Witnesses:

HERMAN RÉE,

JULIUS LEHMANN.